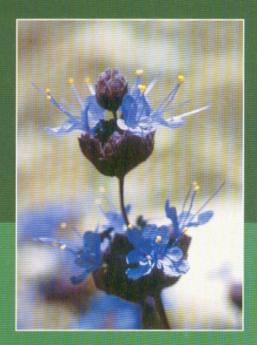
Nevada Test Site

SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR - 1999

October 2000







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NEVADA TEST SITE ANNUAL SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR 1999

Editors: Yvonne E. Townsend and Robert F. Grossman

October 2000

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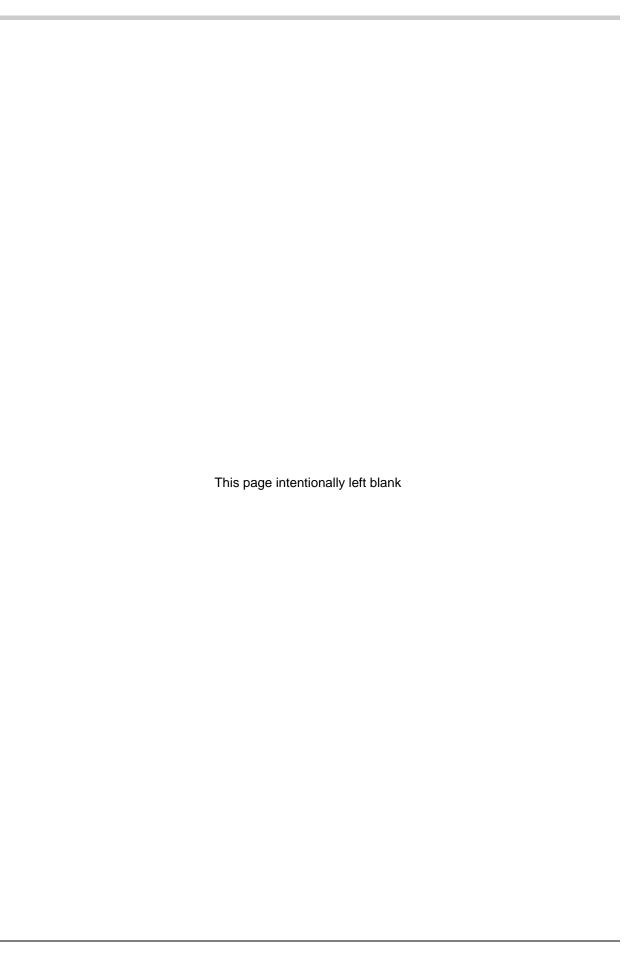
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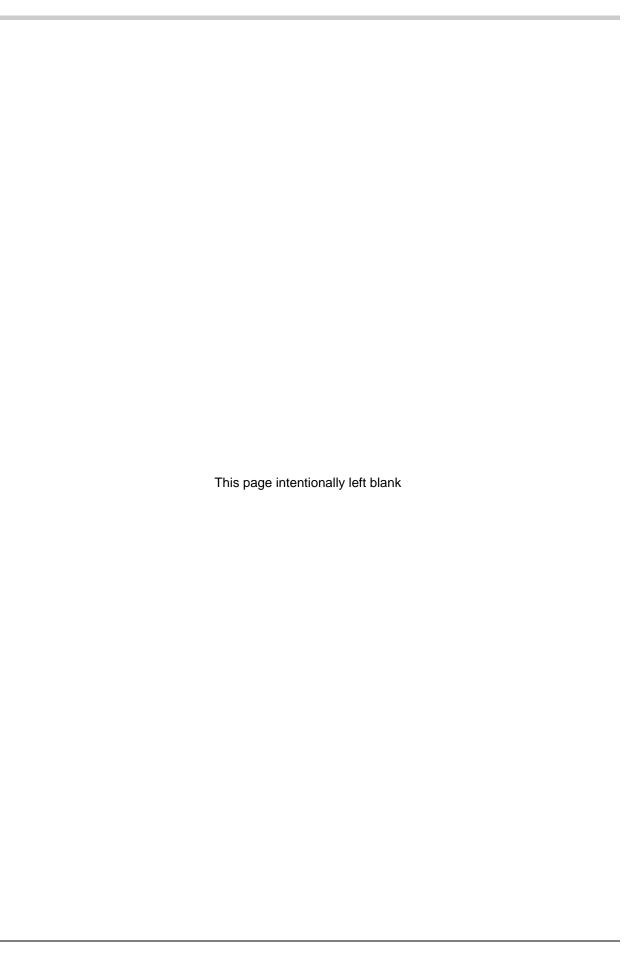
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FOREWORD

Prior to 1989, annual reports of environmental monitoring and assessment results for the Nevada Test Site (NTS) were prepared in two separate parts. Onsite effluent monitoring and environmental monitoring results were reported in an onsite report prepared by the U.S. Department of Energy, Nevada Operations Office (DOE/NV). Results of the Offsite Radiological Surveillance and Long-Term Hydrological Monitoring programs conducted by the U.S. Environmental Protection Agency's (EPA's) Laboratory (various names) in Las Vegas, Nevada, were reported separately by that Agency.

Beginning with the 1989 Annual Site Environmental Report for the NTS, these two documents were combined into a single report to provide a more comprehensive annual documentation of the environmental protection activities conducted for the nuclear testing program and other nuclear and non-nuclear operations at the NTS. The two agencies have coordinated preparation of this eleventh combined onsite and offsite report through sharing of information on environmental surveillance and releases as well as meteorological, hydrological, and other supporting data used in dose-estimation calculations.



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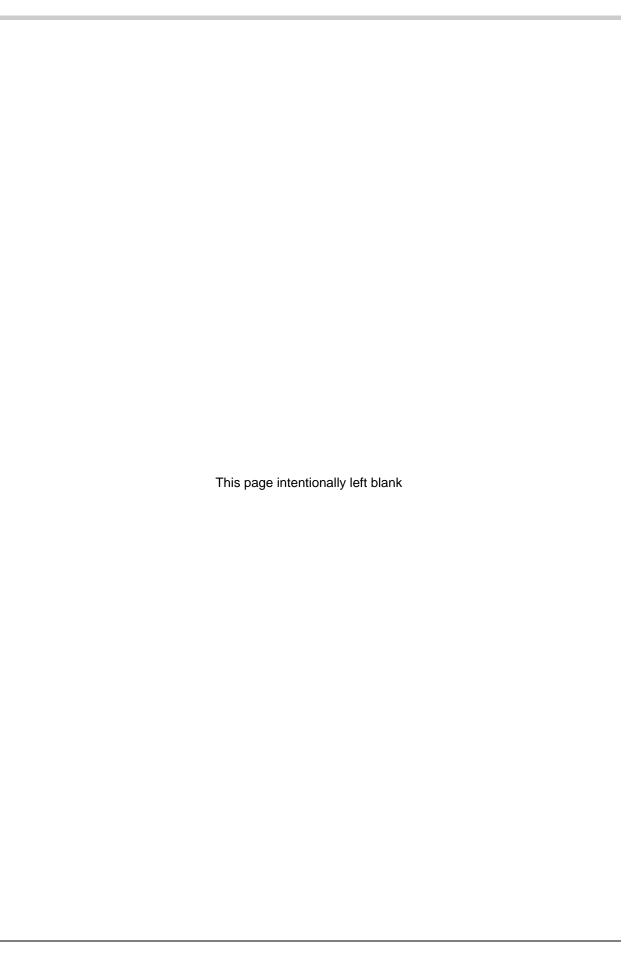


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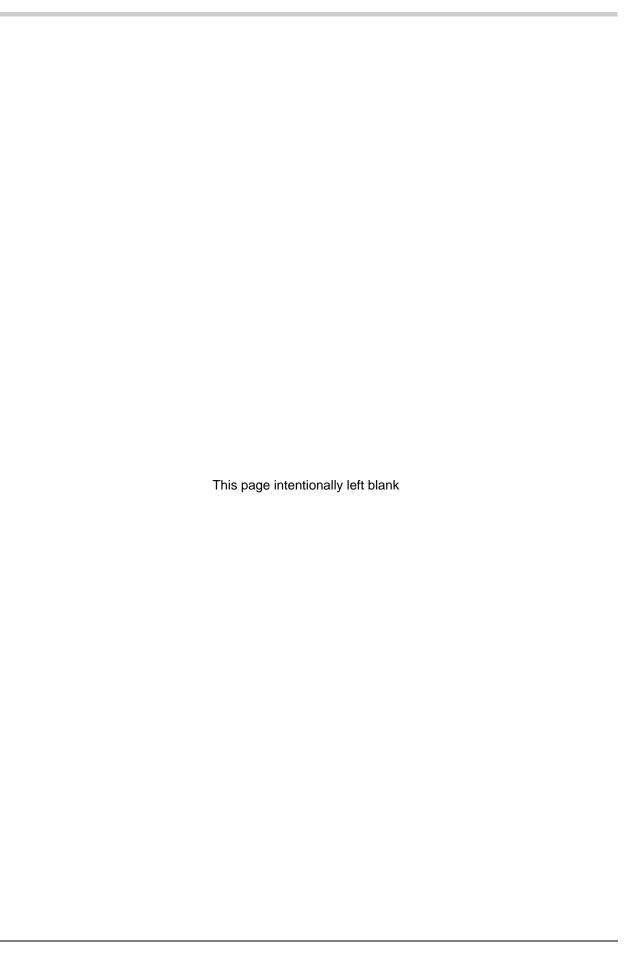
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MEASUREMENT UNITS AND NOMENCLATURE

Radioactivity data in this report are expressed in both traditional units (e.g., pCi/L) and International System (abbreviated SI) units. These units are explained below.

Ambient background radiation to which people are exposed. Naturally occurring background

radioactive elements contained in the body, in the ground, and in construction materials, cosmic radiation, and radioactivity in the air all contribute to an average radiation dose equivalent to humans of about 350 mrem per year. In laboratory measurements of radioactivity in samples, background is the activity determined when a sample of distilled water is processed through the system

(Also called a blank).

becquerel Abbreviation Bq. The Bq is the SI unit for disintegration rate.

1 Bq = 1 disintegration per second.

concentration Activity per unit volume or weight. Usually expressed as µCi/mL, pCi/m³ or pCi/g.

Abbreviation Ci. The historic unit for disintegration rate. 1 Ci = 3.7×10^{10} curie

disintegrations per second = 3.7×10^{10} Bq. The usual submultiples of Ci are mCi (10^{-3} Ci or one thousandth Ci), μ Ci (10^{-6} Ci or one millionth Ci), and pCi

 (10^{-12}) or one trillionth Ci).

EDE Effective dose equivalent - radiation dose corrected by various weighting factors

that relate dose to the risk of serious effects.

rem Rem (for roentgen equivalent man) is the unit for expressing dose equivalent, or

the energy imparted to a person when exposed to radiation. The commonly used subunit is the millirem (10⁻³ rem or one thousandth rem), abbreviated mrem.

roentgen Abbreviation R. A unit expressing the intensity of X or γ radiation at a point in

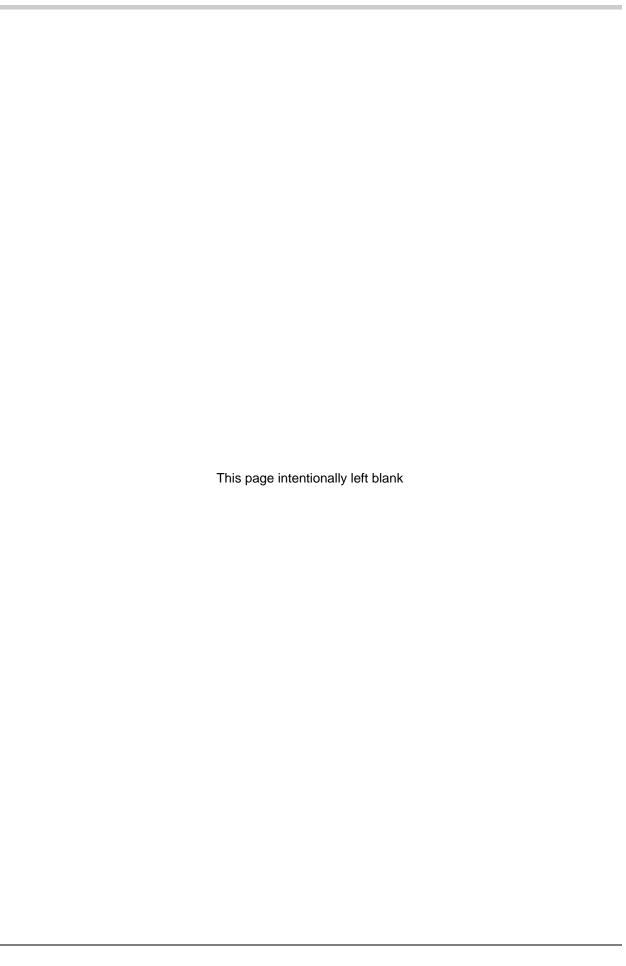
air. The usual unit is mR or 10⁻³ R (one thousandth R).

The SI unit for volume is m³ (cubic meter). Other units used are liter (L) and mL volume

 $(10^{-3} L)$ or one thousandth liter). One cubic meter = 1,000 L, 1 L = 1.06 quarts.

The elements and corresponding symbols used in this report are:

<u>Element</u>	<u>Symbol</u>	<u>Element</u>	<u>Symbol</u>
Element Actinium Aluminum Argon Arsenic Barium Beryllium Bismuth Boron Cadmium Calcium Cesium Chlorine Chromium Cobalt Copper Europium Fluorine	Ac	Element Iron Krypton Lead Lithium Mercury Nitrogen Oxygen Plutonium Potassium Radium Radon Selenium Silver Strontium Thallium Thorium	Symbol Fe Kr Pb Li Hg N O Pu K Ra Rn Se Ag Sr TI Th Tm
Hydrogen lodine	H I	Tritium Uranium	³ H U



LIST OF ACRONYMS AND ABBREVIATIONS

AIP Agreement in Principle ANOVA Analysis of Variance

APCD Air Pollution Control Division

ARL/SORD Air Resources Laboratory, Special Operations and Research Division

ASCII American Standard Code for Information Interchange

ASER Annual Site Environmental Report
ASL Analytical Services Laboratory
ASN Air Surveillance Network
BCG Biota Concentration Guide

BEIDMS Bechtel Environmental Integrated Data Management System

BHPS Bureau of Health Protection Services
BLM U.S. Bureau of Land Management

BN Bechtel Nevada

BOD Biochemical Oxygen Demand

CAA Clean Air Act

CADD Corrective Action Decision Document

CAP Corrective Action Plan

CAP88-PC Clean Air Package 1988 (EPA software program for estimating doses)

CAU Corrective Action Unit

CEDE Committed Effective Dose Equivalent
CEI Compliance Evaluation Inspection

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CFR Code of Federal Regulations

CP Control Point

CRMP Community Radiation Monitoring Program
CTLP Community Technical Liaison Program

CWA Clean Water Act
CX Categorical Exclusion

CY Calendar Year

DCG Derived Concentration Guide
DDR Data Discrepancy Report
DOD U.S. Department of Defense
DOE U.S. Department of Energy

DOE/HQ DOE Headquarters

DOELAP DOE Laboratory Accreditation Program

DOE/NV DOE Nevada Operations Office

DQO Data Quality Objectives

DRI Desert Research Institute, University and Community College System, Nevada

EA Environmental Assessment EDE Effective Dose Equivalent

EHS Extremely Hazardous Substances
EIS Environmental Impact Statement

ELU Ecological Landform Unit

EMAC Ecological Monitoring and Compliance

EML Environmental Measurements Laboratory (DOE)

EO Executive Order

EOD Explosive Ordnance Disposal (NTS)
EODU Explosive Ordnance Disposal Unit
EPA U.S. Environmental Protection Agency

List of Acronyms and Expressions, cont.

EPCRA Emergency Reporting and Community Right-to-Know Act

ERA Environmental Resource Associates ERP Environmental Restoration Project

ESA Endangered Species Act

ESHD Environment, Safety and Health Division

ET Evapotranspiration

FFACO Federal Facilities Agreement and Consent Order

FFCAct Federal Facilities Compliance Act

FIFRA Federal Insecticide Fungicide and Rodenticide Act

FY Fiscal Year

GCD Greater Confinement Disposal

gpm Gallons per Minute

HSC Hazardous Materials Spill Center

HTO Tritiated Water

HWSU Hazardous Waste Storage Unit

ICRP International Commission on Radiological Protection

ID Identification

INEEL Idaho National Engineering and Environmental Laboratory

IT International Technology

LANL Los Alamos National Laboratory
LAO Los Alamos Operations (BN)
LDR Land Disposal Restrictions

LLNL Lawrence Livermore National Laboratory

LLW Low-Level (Radioactive) Waste LO Livermore Operations (BN)

LTHMP Long-Term Hydrological Monitoring Program
MAPEP Mixed Analyte Performance Evaluation Program

MDC Minimum Detectable Concentration
MEI Maximally Exposed Individual
MOU Memorandum of Understanding
MQO Measurement Quality Objectives

MSL Mean Sea Level

NAC Nevada Administrative Code

NAFR Nellis Air Force Range

NAGPRA Native American Graves Protection and Repatriation Act

NDEP Nevada Division of Environmental Protection

NEPA National Environmental Policy Act

NESHAP National Emission Standards for Hazardous Air Pollutants

NHPA National Historic Preservation Act

NIST National Institute of Standards and Technology

NLVF North Las Vegas Facility (BN)

NPDES National Pollution Discharge Elimination System

NR National Register

NRHP National Register of Historic Places
NSHPO Nevada State Historic Preservation Office

NTS Nevada Test Site

NVLAP National Voluntary Laboratory Accreditation Program (NIST)

OEMP Offsite Environmental Monitoring Program

ORSP Offsite Radiological Safety Program

P2 Pollution Prevention

List of Acronyms and Expressions, cont.

PA Performance Assessment
PCB Polychlorinated Biphenyl
PE Performance Evaluation

PEP Performance Evaluation Program
PES Performance Evaluation Study
PIC Pressurized Ion Chamber

PPOA Pollution Prevention Opportunity Assessments

QA Quality Assurance

QAP Quality Assessment Program

RBRC Rechargeable Battery Recycling Corporation RCRA Resource Conservation and Recovery Act

RCT Radiological Control Technician

R&IE-LV Radiation & Indoor Environments National Laboratory - Las Vegas (EPA)

RMP Resource Management Plan

ROD Record of Decision

RREMP Routine Radiological Environmental Monitoring Plan

RSD Relative Standard Deviation
RSL Remote Sensing Laboratory (BN)
RWMS Radioactive Waste Management Site

RWMS-3 Radioactive Waste Management Site, Area 3 RWMS-5 Radioactive Waste Management Site, Area 5

SAFER Streamlined Approach for Environmental Restoration SARA Superfund Amendments and Reauthorization Act

SDWA Safe Drinking Water Act SQL Structured Query Language

STL Special Technologies Laboratory (BN)
TaDD Tactical Demilitarization Development

TLD Thermoluminescent Dosimeter
TRU Transuranic Radionuclide
TSCA Toxic Substances Control Act

TTR Tonopah Test Range
UGTA Underground Testing Area
U.S. United States of America
USFWS U. S. Fish and Wildlife Service

USES U. S. Geological Survey
US Underground Storage Tank
V.C. Volatile Organic Compound
VIM Vades Zone Monitoring

WACO Washington Aerial Measurements Operations (BN)

WE Waste Examination Facility
WIMP Waste Isolation Pilot Plant

WI Work Instructions

WPM-OF Western Poohed Mesa Oasis Valley

